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मानक

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IS 7604 (1975): Length Bar Accessories [PGD 25: Engineering Metrology]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
**SPECIFICATION FOR
LENGTH BAR ACCESSORIES**

1. Scope — Covers the requirements of the following length bar accessories:

- a) Base,
- b) Large radiused jaw,
- c) Small plane-faced jaw, and
- d) Spherical end-piece.

1.1 The details regarding special set of slip gauges used to obtain intermediate lengths are given in Appendix A. Appendix B briefly describes the uses of the various accessories.

2. Nomenclature — For the purpose of this standard, the nomenclature given in Fig. 1 to 5 shall apply.

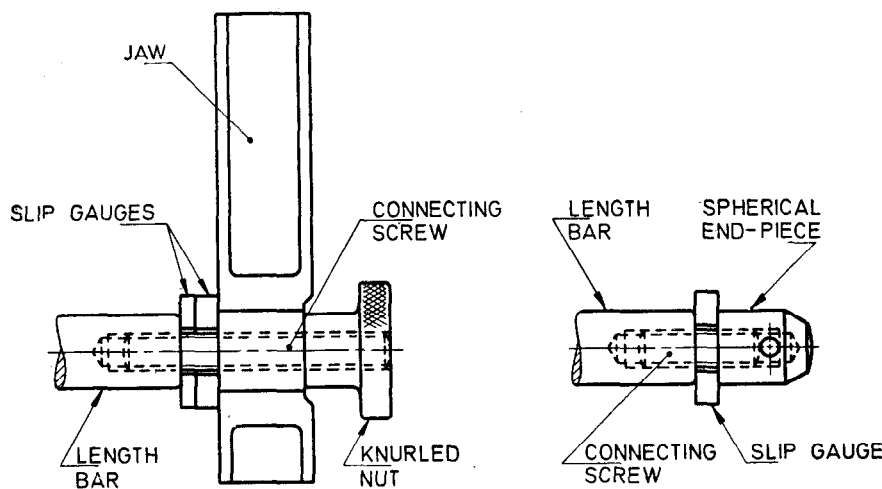
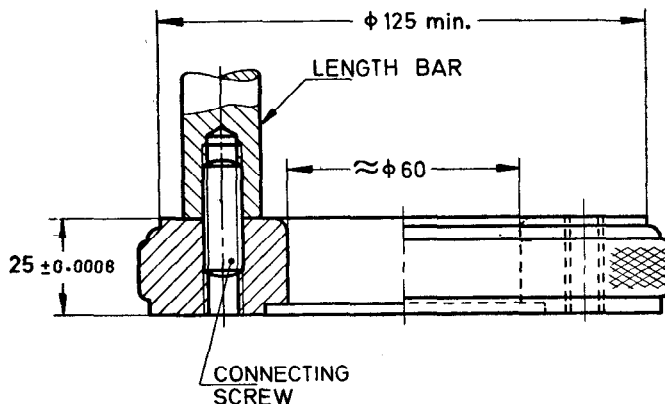


FIG. 1 ASSEMBLY OF LENGTH BAR ACCESSORIES

3. Design and Dimensions

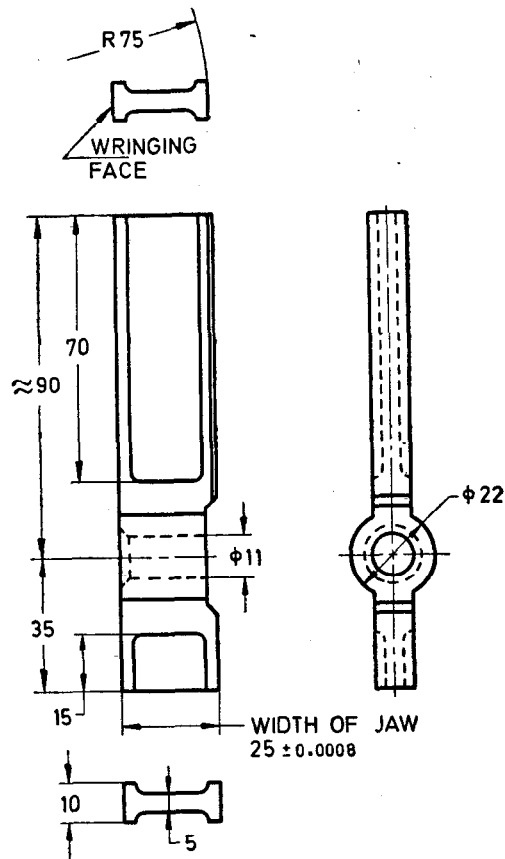
3.1 Base — The base (see Fig. 2) shall have a diameter of at least 125 mm to provide adequate stability when used in conjunction with length bars up to 1 500 mm in length. It shall be provided with either 4 or 6 threaded holes for fixing of the length bars.



All dimensions in millimetres.

FIG. 2 DIMENSIONS FOR BASE

3.2 *Large Radiused Jaw* — The general design and dimensions of the large radiused jaw shall be as shown in Fig. 3.



All dimensions in millimetres.

FIG. 3 DIMENSIONS FOR LARGE RADIUSED JAW

3.3 *Small Plane-Faced Jaw* — The general design and dimensions of the small plane-faced jaw shall be as shown in Fig. 4.

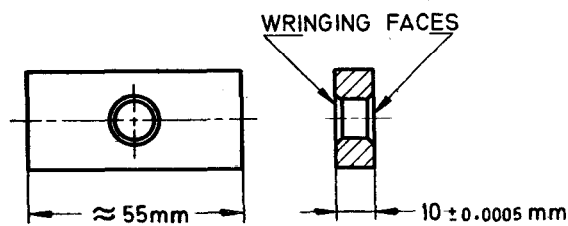


FIG. 4 DIMENSIONS FOR SMALL PLANE-FACED JAW

3.4 *Spherical End-Piece* — The general design and dimensions of the spherical end-piece shall be as shown in Fig. 5.

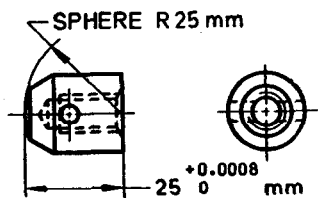


FIG. 5 DIMENSIONS FOR SPHERICAL END-PIECE

4. Material and Hardness — The accessories shall be made of high grade steel. Where possible, they shall be hardened throughout or case-hardened and suitably stabilized by heat treatment. The hardness of the reference faces of the accessories shall be 750 HV, Min (62 HRC approximately) [see IS : 1501-1968 Method for Vickers hardness test for steel (*first revision*)].

5. Accuracy

5.1 Base

5.1.1 Flatness — The upper and lower surfaces of the base shall be flat to within 0.000 25 mm over the width of the annulus and to within 0.001 5 mm over the full diameter of the base.

5.1.2 Parallelism — The upper and lower surfaces of the base shall be parallel to one another within 0.000 25 mm per 25 mm of length.

5.2 Large Radiused Jaw

5.2.1 Flatness — The wringing face shall be flat within 0.001 mm over its entire area.

5.2.2 Parallelism — The gauging width of the jaw shall be parallel within 0.000 25 mm per 25 mm of length.

5.3 Small Plane-Faced Jaw

5.3.1 Flatness — The wringing faces shall be flat within 0.000 5 mm over the entire area of the face.

5.3.2 Parallelism — The wringing faces shall be parallel within 0.001 mm.

5.4 Spherical End-Piece

5.4.1 Flatness — The plane face of the spherical end-piece shall be flat within 0.000 25 mm.

6. Finish

6.1 Base — The bearing surfaces of the base shall be finished by high grade lapping.

6.2 Large Radiused Jaw — One face of the jaw shall be lapped flat and the other face shall be lapped to cylindrical form with a radius of about 75 mm. Sharp edges shall be removed and the unimportant surfaces left clean but dull.

6.3 Small Plane-Faced Jaw — The working faces of the jaw shall be finished by high grade lapping. Sharp edges shall be removed and the unimportant surfaces left clean but dull.

6.4 Spherical End-Piece — The plane face of the spherical end-piece shall be finished by high grade lapping and the other face shall be ground to spherical form and lapped to a high polish. Sharp edges shall be removed and the remaining faces ground all over.

7. General Requirements — Sufficient connecting screws M 10 × 1.5 of precision grade and knurled nuts for assembly shall be provided with each set of accessories (see Fig. 1 and 2). The screws shall assemble the accessories quite freely with the length bars and shall not prevent the wringing faces from coming into satisfactory contact. They shall be well finished all over and all sharp edges shall be removed. Suitable tolerances for the type of fit required are H6 for the holes and g5/g6 for the connecting screws.

8. Marking

8.1 The large radiused jaw shall be marked with its nominal size, namely, 25 mm in bold characters.

8.2 The small plane-faced jaw shall be marked 10 mm in bold characters.

8.3 The spherical end-piece shall be marked with its nominal size, namely, 25 mm in bold characters.

8.4 ISI Certification Marking — Details available with the Indian Standards Institution.

9. Packing — The length bar accessories shall be protected against climatic conditions by a suitable corrosion preventive preparation. Each set of accessories shall be provided with a substantial well made case. The case shall be dust-proof and shall have separate compartments for each accessory. When the lid of the case is closed and fastened, each accessory shall be held firmly in its seating.

APPENDIX A

(Clause 1.1)

SLIP GAUGES USED WITH LENGTH BAR ACCESSORIES

A-1. The length bars are normally arranged to give sizes in steps of 25 mm. In order to obtain intermediate lengths while using the jaws or spherical end-piece along with the length bars the following set of slip gauges are provided:

<i>Size</i>	<i>Number of Pieces</i>
2 each of 2'001 to 2'009 mm	18
2 each of 2'01 to 2'09 mm	18
2 each of 2'1 to 2'9 mm	18
2 each of 1, 2, 3, 4, 5, 6, 7, 8 and 9 mm	18
Total	<u>72</u>

A-2. The method of assembly of the spherical end-piece with the length bar, with the slip gauges inserted to obtain intermediate lengths is shown in Fig. 6.

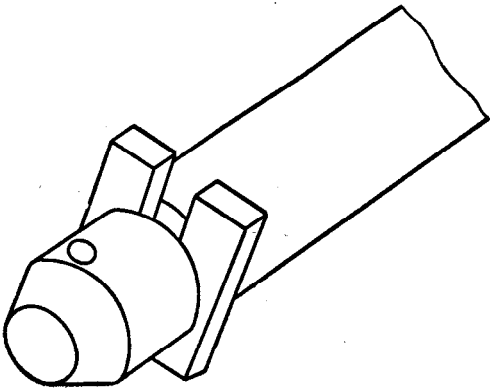


FIG. 6 SPHERICAL END-PIECE IN POSITION SHOWING SLIP GAUGE
INSERTED TO OBTAIN INTERMEDIATE LENGTH

APPENDIX B

(Clause 1.1)

USE OF LENGTH BAR ACCESSORIES

B-1. Combination length bars are used for precision measurement between external points of a component. In combination with the accessories, more complicated measurements, both internal and external, may be carried out.

B-1.1 Base — By mounting the length bar on the base and fixing the large radiused jaw at the other end the length bar may be converted into a height gauge as shown in Fig. 7.

B-1.2 Large Radiused Jaw — These are used for taking direct internal measurement of bores. The large radiused jaw assembled to the length bar is shown in Fig. 7.

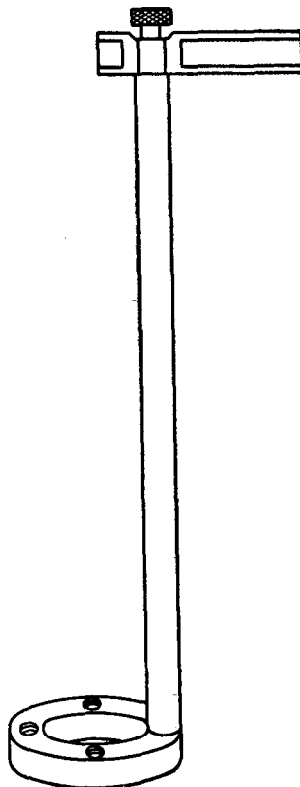


FIG. 7 LENGTH BAR ASSEMBLED TO LARGE RADIUSSED JAW AND BASE TO FORM HEIGHT GAUGE

B-1.3 Small Plane Faced Jaw — These jaws are normally used for external measurement but may be used for checking flat internal surfaces also. The small plane-faced jaw assembled to the length bar is shown in Fig. 8.

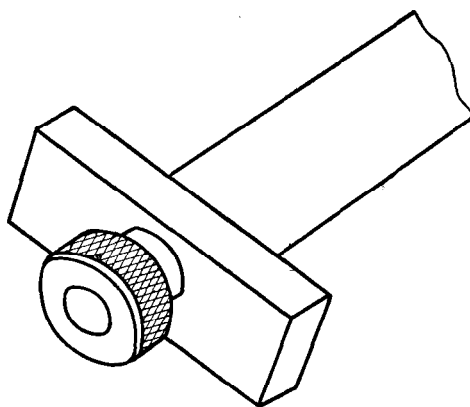


FIG. 8 SMALL PLANE-FACED JAW FITTED TO LENGTH BAR

B-1.4 Spherical End-Piece — By use of this the length bar is converted into a highly accurate pin gauge.

EXPLANATORY NOTE

This standard is an adjunct to IS: 7014-1973 'Length bars'. In the preparation of this standard, considerable assistance has been derived from BS: 1790-1961 'Specification for length bars and their accessories', issued by the British Standards Institution.